

WHAT IS CLAIMED IS:

1. A collection of particles comprising aluminum oxide, the collection of particle having an average diameter from about 5 nm to about 500 nm and effectively no particles have a diameter greater than about four times the average diameter of the collection of particles.

2. The collection of particles of claim 1 wherein the collection of particles have an average diameter from about 5 nm to about 25 nm.

3. The collection of particles of claim 1 wherein the aluminum oxide has a crystalline structure of γ - Al_2O_3 .

4. The collection of particles of claim 1 wherein the collection of particles includes effectively no particles with a diameter greater than about three times the average diameter.

5. The collection of particles of claim 1 wherein the collection of particles includes effectively no particles with a diameter greater than about two times the average diameter.

6. The collection of particles of claim 1 wherein the collection of particles have a distribution of particle sizes such that at least about 95 percent of the particles have a diameter greater than about 40

RECEIVED

Sub
B3

percent of the average diameter and less than about 160 percent of the average diameter.

7. The collection of particles of claim 1 wherein the collection of particles have a distribution of particle sizes such that at least about 95 percent of the particles have a diameter greater than about 60 percent of the average diameter and less than about 140 percent of the average diameter.

8. The collection of particles of claim 1 wherein the collection of particles have a distribution of particle sizes such that at least about 99 percent of the particles have a diameter greater than about 40 percent of the average diameter and less than about 160 percent of the average diameter.

9. A polishing composition comprising a dispersion of aluminum oxide particles of claim 1.

10. The polishing composition of claim 9 wherein the aluminum oxide aluminum oxide has a crystalline structure of $\gamma\text{-Al}_2\text{O}_3$.

11. The polishing composition of claim 9 wherein the polishing composition comprises from about 0.05 percent by weight to about 15 percent by weight aluminum oxide particles.

12. The polishing composition of claim 9 wherein the polishing composition comprises from about 1.0

20250723 08:23:45

Sub
By

10

Sub
prisin

The method of claim 16 wherein the particles have an average diameter from about 100 nm.

19. A collection of particles comprising aluminum oxide, the collection of particle having an average

17. A method for producing a collection of aluminum oxide particles having an average diameter from about 5 nm to about 500 nm, the method comprising pyrolyzing a molecular stream in a reaction chamber, the molecular stream comprising an aluminum precursor, an oxidizing agent, and an infrared absorber, where the pyrolysis is driven by heat absorbed from a laser beam.

18. The method of claim 16 wherein the aluminum oxide particles have an average diameter from about 5 nm to about 100 nm.

19. A collection of particles comprising aluminum oxide, the collection of particle having an average

~~5 m
le s:
cles
ne av
the a~~

add